


Abstract

Hazard Evaluation of Novel Plasticizer, Di(2-Propylheptyl) Phthalate, to Aquatic Ecosystems [†]

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Plastics differ in chemical composition due to numerous chemicals (additives) used to produce plastic for specific applications. Plastic additives may enter the environment not only from the plastic waste during its weathering but also at all stages of the plastic products' life cycle [1]. Plastic additives can be hazardous to living organisms and play a significant role in the adverse effects of plastic contamination [2,3]. However, there are knowledge gaps concerning the ecotoxicity of plastic additives [4]. Plasticizers are one group of plastic additives of which phthalates are the most used, but they are also known for their toxic potential. As the use of phthalate plasticizers has been increasingly regulated since the beginning of the 21st century, alternative plasticizers have appeared in their stead. The current study was conducted to obtain new experimental data on the potential ecotoxicity of high molecular weight phthalate plasticizer DPHP (Di(2-propylheptyl) phthalate) in comparison to DEHP (Di-2-ethylhexyl phthalate), which was a formerly dominant but now restricted [5] low molecular weight plasticizer. For hazard evaluation, long-term (21 day) effects were studied in life cycle tests with *Daphnia magna*, which is a representative of microcrustacea and important link of the freshwater food web. *D. magna* was exposed to the plasticizers via spiked sediment (sand). The tests were conducted in lake water to increase the environmental relevance of the hazard data. Alarmingly, preliminary results showed that DPHP may be more hazardous to aquatic organisms than DEHP. The mortality of the organisms, exposed to DPHP plasticizer, was higher than with DEHP. *D. magna* reproduction (the average number of offspring/organism) was lower than in the unexposed control and comparable for both DPHP and DEHP. However, since fewer offspring were also recorded for the used solvent (ethyl acetate) control, the affected reproduction was not necessarily attributable to the plasticizers.

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